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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/245,269	02/05/1999	JACK A MANDELMAN	99P7451US	4716

530 7590 05/08/2003

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EXAMINER

NGUYEN, DILINH P

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 05/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/245,269

Applicant(s)

MANDELMAN ET AL.

Examiner

DiLinh Nguyen

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenney (U.S. Pat. 6020250) in view of Cogan et al. (U.S. Pat. 4845051) and further in view of Kagaya et al. (U.S. Pat. 5523593).

Kenney discloses a semiconductor device (fig. 5c, column 14, lines 50 et seq.) comprising:

a semiconductor body defining a trench 170 (fig. 3d) having a bottom and sidewalls and having an upper portion and a lower portions; and

the lower portion of the isolation trench being at least filled with an electrically conductive material 208a that has side wall portion which are at least partly separate from the sidewalls of the lower portion of the trench by a first electrical insulator 176 (column 14, lines 1-2), the electrical conductive material having a lower portion that is in electrical contact with the semiconductor body at the bottom of the trench.

Kenney fails to disclose the upper portion of the isolation trench being filled with a second electrical insulator.

Cogan et al. disclose a semiconductor device (fig. 5) comprising:

a lower portion of a trench being at least partly filled with an electrically conductive material 22 and the upper portion of the isolation trench being filled with an electrical insulator 24 (fig. 5, column 5, lines 6-8). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kenney to form a contact hole and control the current through the resulting for the semiconductor device, as shown by Cogan et al.

Kenney and Cogan et al. fail to disclose the trench enclosing an area of the semiconductor body which contains a semiconductor structure.

Kagaya et al. disclose a semiconductor device (cover fig., abstract) comprising: a trench 9 enclosing an area of the semiconductor body which contains a semiconductor structure which is to be electrically isolated from other semiconductor structures that are also contained within the semiconductor body but which are not located within the enclosed area to reduce low frequency oscillation and provide a compound semiconductor IC which is most suitable for a superspeed operation. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kenney and Cogan et al. to reduce low frequency oscillation and provide a compound semiconductor IC which is most suitable for a superspeed operation, as shown by Kagaya et al.

- Regarding claim 2, Kenney discloses the first insulator 176 is silicon dioxide (column 12, lines 17-18); Cogan et al. disclose the upper portion of the isolation trench being filled with the electrical insulator 24 (fig. 5, column 5, lines 6-8),

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wherein the insulator is silicon dioxide and it would have been obvious matter of design choice to provide the electrically conductive material is doped polysilicon.

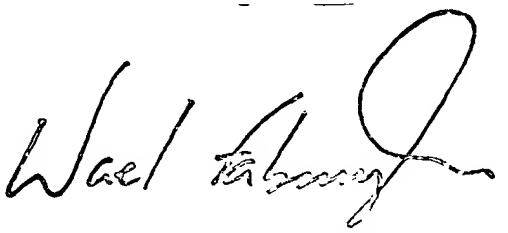
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN  
May 2, 2003

  
SUPERVISORY PRIMARY EXAMINER  
TECHNOLOGY CENTER 2000